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67,010-090; H2616-ED

UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Kenneth Marks
Serial No.:	10/816,092
Filed:	4/1/2004
Art Unit:	2837
Examiner:	Miller, Patrick L.
Title:	INTEGRATED SKID WITH MULTIPLE-MOTOR CONTROLLER
Attorney Docket No.:	67010-090; H2616-ED

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Dear Sir:

Subsequent to the filing of the Notice of Appeal on June 7, 2006, appellant now submits its brief. Fees in the amount of $500.00 may be charged to Deposit Account No. 08-0385 in the name of Hamilton Sundstrand. Should any additional fees be necessary, you are hereby authorized to charge such fees to the above-referenced deposit account.

Real Party in Interest

The real party in interest is Hamilton Sundstrand, the assignee of the entire right in this application.

Related Appeals and Interferences

There are no prior or pending appeals, interferences or judicial proceedings relating to this appeal, which may directly effect or be directly effected by, or have a bearing on, the Board's decision in this appeal.

Status of Claims

Claims 1-86, and 9-19 stand finally rejected and appealed. Claim 20 is objected to as containing allowable subject matter. Claims 8 and 9 have been cancelled.

Status of Amendments

In an amendment filed some time ago, applicant inserted the subject matter of claims 7 and 8 into claim 1. However, claims 7 and 8 were not cancelled at that time. Thus, after final rejection, appellant submitted an amendment dated April 24, 2006, which asked only to cancel those two redundant claims. By Advisory Action dated May 30, 2006, the examiner refused entry of the amendment. Thus, the Claim Appendix, and the pending claims, include claims 7 and 8, even though appellant would cancel those claims if given the opportunity.

Summary of the Claimed Subject Matter

Independent claim 1 relates to a controller for controlling a plurality of motors in a fluid handling system. The invention is directed to providing a system which requires fewer components than are required in the prior art.

Thus, claim 1 requires a connector input/output port (218) that communicates with at least one sensor (216) in a fluid handling system. There is at least one digital signal processor and a gate driver interface (224) that evaluates sensor data and generates a control signal.

There is at least one communication module (226) which communicates with the at least one DSP and gate driver interface. The at least one communication module includes at least one motor based on the control signal. The control signal receives AC power under normal conditions, but is provided with a local power supply that is a DC back-up power supply. The DSP and gate driver switches to DC back-up power supply to the at least one motor in the event of a main power failure. (See, for instance, paragraphs 16-20.) Thus, claim 1 requires that there be a motor which alternatively receives AC power or D power from a local power supply. The DSP and gate driver interface are operable to switch to DC back-up power supply in the event of a main power failure.

The prior art had typically included a DC back-up power supply, however, that back-up power supply powered a separate DC-powered motor. The present invention allows the elimination of this redundant motor.

Independent claim 9 relates to an integrated fluid handling system which includes a plurality of motors (106) and a plurality of devices (101, 108, 110 and 112) associated with plurality of motors. There are a plurality of sensors (216) that generate sensor data corresponding to the operation of the plurality of devices.

A multi-motor controller (104) controls the plurality of motors. The motor controller includes a connector input/output port (218) that communicates with at least one sensor. Further, the controller includes a plurality of digital signal processor and gate driver interfaces (224) that evaluate sensor data from the plurality of sensors, and generate a control signal. A plurality of communication modules (226) are connected to the plurality of DSP and gate driver interfaces. Each communication module controls at least one motor based upon the control signal. (See paragraphs 11-14.)

Grounds of Rejection to be Reviewed on Appeal

1. The 35 U.S.C. §112 rejection of claims 7 and 8 is not contested. As mentioned, the claims will be cancelled if appellant is allowed to do so.
2. The 35 U.S.C. §103 rejection of claim 1 over U.S. Patent 6,731,089 to Cho, et al. taken with U.S. Patent 6,933,698 to Miura, et al. is appealed.

3. The 35 U.S.C. §103 rejection of claim 1 over U.S. Patent 5,638,387 to Palleggi, et al. taken with U.S. Patent 5,876,374 to Blomquist is appealed.
4. The 35 U.S.C. §103 rejection of claim 1 over U.S. Patent 5,619,111 to Katagiri, et al. taken with Blomquist is appealed.
5. The 35 U.S.C. §103 rejection of claim 9 over U.S. Patent 6,553,770 to Tisdale, et al. taken with U.S. Patent 6,771,032 to Cox-Smith is appealed.
6. The 35 U.S.C. §103 rejection of claim 9 over Tisdale, et al. taken with Katagiri, et al. is contested.
7. The 35 U.S.C. §103 rejection of claim 14 over Tisdale, et al., taken with Katagiri, et al., and further in view of Blomquist is contested.

Arguments

1. Rejections of Claim 1

Cho, et al. Combined with Muira, et al.

The examiner recognizes that Cho, et al. does not disclose the back-up DC power supply requirements. Instead, the examiner argues that Muira, et al. does disclose a DC power back-up supply. However, Muira, et al. is not a motor power supply. Thus, there is certainly no disclosure in Muira, et al. that would meet the limitations of the claim that there be a DSP and gate driver interface, which switches between AC power and DC power being supplied to the same motor. Simply, the references, even if properly combined, cannot meet this limitation.

Moreover, as admitted in this application, in the prior art, DC back-up power supplies were known, but were provided with a separate and distinct motor. Cho, et al. would look to this type arrangement if faced with a back-up power supply problem.

Simply, the proposed combination is not suggested in the art.

The examiner argues that the term "local" is a relative term, however, it is clear that the local power supply is part of the system, and for this additional reason, Muira does not properly meet the claims.

Palleggi, et al. Combined with Blomquist

This rejection should be reversed for reasons almost identical to the reasons for the first rejection. Nothing within Palleggi, et al. discloses the back-up power supply. Blomquist discloses a motor control, utilizing a DC back-up power supply, however, it does not disclose the control structure wherein there is at least one DSP and gate driver interface which selects between the DC power supply, and an AC power supply, and switches between the two to supply to the same motor. Again, there is also no suggestion to combine the references.

The examiner argues that there is a suggestion to provide the advantage that the Palleggi, et al. device could operate even after a power failure, however, this misses the point of the deficiencies in the references as mentioned above.

Katagiri, et al. Combined With Blomquist

This rejection is improper for reasons identical to the above rejection. Blomquist fails to disclose the specific features of the present invention as required by the claims, and there would be no true suggestion to combine these references.

2. Rejections of Claim 9

Tisdale, et al. Combined With Cox-Smith

Claim 9 requires specific control features for a particular type system. The examiner recognizes that Tisdale, et al. cannot meet these limitations. As one example, Tisdale, et al. may well disclose a plurality of motors, however, it does not disclose the DSP and gate driver interfaces, nor the control steps of evaluating sensor data and generating a control signal, and sending the control signals to a communication module, with each communication module corresponding to one of a plurality of DSP and gate driver interfaces, and controlling at least one motor based upon the control signal.

Rather than recognizing these features are allowable, the examiner points to the Cox-Smith reference and argues this reference discloses a control which would meet the claims. However, there would be no suggestion to combine these references. Cox-Smith provides some control features to "synchronize motor operation," as alleged by the examiner. However, there is no benefit shown on this record to modify Tisdale, et al. such that its several motors are "synchronized." The motors all are operating independently of each other, and there would be no proper reason to combine the references. The combination is not suggested.

Tisdale, et al. Combined With Katagiri, et al.

Again, the examiner recognizes the deficiencies in Tisdale, et al. However, the examiner argues that Katagiri, et al. would meet the limitations of the claims, and to supply a motor control system as disclosed by Katagiri, et al. would improve "control liability" in the Tisdale, et al. device.

However, there is no true suggestion to combine these references. Again, Tisdale, et al. includes a complex system, and has its own controls. There is nothing within Katagiri, et al. that would suggest the proposed modification. Simply, this combination is based only upon hindsight reconstruction.

2. Rejection of Claim 14

Claim 14 is dependent to claim 9 and adds in the feature that there is a local DC power supply that acts as a back-up power supply to power the plurality of motors, and wherein the plurality of DSP and gate driver switch to the DC back-up power supply to power the motor in the event of a main power line failure.

The examiner attempts to reject these claims over Blomquist et al., added to the claim 9 combinations. Again, Blomquist does not meet the claims for the reasons mentioned above. Moreover, there is no suggestion to modify Tisdale, et al. with this teaching. Tisdale, et al. does not disclose any features which would benefit from anything arguably disclosed in Blomquist.

CONCLUSION

For the reasons set forth above, allowance of all claims is in order. Reversal of all rejections is requested.

Respectfully submitted,

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Dated: August 4, 2006

CERTIFICATE OF TRANSMISSION UNDER 37 CFR 1.8

I hereby certify that this correspondence is being facsimile transmitted to the United States patent and Trademark Office, fax number (571) 273-8300, on August 4, 2006.

Laura Combs

CLAIMS APPENDIX

1. A controller for controlling a plurality of motors in a fluid handling system, comprising:

a connector input/output port that communicates with at least one sensor in the fluid handling system to obtain sensor data;

at least one digital signal processor (DSP) and gate driver interface that evaluates the sensor data and generates a control signal based on the sensor data;

at least one commutation module in communication with said at least one DSP and gate driver interface, wherein said at least one commutation module controls at least one motor based on the control signal;

said at least one motor receiving AC power under normal conditions;

a local power supply that selectively powers the motors; and

the local power supply is a DC backup power supply, and wherein said at least one DSP and gate driver switches to the DC backup power supply to supply power to said at least one motor in the event of a main power failure.

2. The controller of claim 1, wherein each DSP and gate driver interface has a corresponding commutation module.

3. The controller of claim 1, wherein each of said plurality of motors has a corresponding DSP and gate driver interface and a corresponding commutation module.

4. The controller of claim 1, wherein at least one of said plurality of motors shares one DSP and gate driver interface and one motor commutation module.

5. The controller of claim 1, wherein at least one of said plurality of motors is a binary-function motor, and wherein the controller further comprises a card to control said at least one binary-function motor.

6. The controller of claim 5, wherein at least one of said plurality of motors is a variable speed motor, and wherein said at least one commutation module controls at least one variable-speed motor.

9. An integrated fluid handling system, comprising:

a skid mounting a plurality of motors;

a plurality of fluid-handling devices associated with said plurality of motors, and said plurality of fluid-handling devices handling at least a plurality of distinct fluids for delivery to a gas turbine engine;

a plurality of sensors that generate sensor data corresponding to the operation of said plurality of devices;

a multi-motor controller on said skid that controls said plurality of motors, the multi-motor controller having

a connector input/output port that communicates with at least one sensor in the fluid handling system to obtain sensor data from said plurality of sensors,

a plurality of digital signal processor (DSP) and gate driver interfaces that evaluate the sensor data from said plurality of sensors and generate a control signal based on the sensor data, and

a plurality of commutation modules, each commutation module corresponding to one of said plurality of DSP and gate driver interfaces, wherein each commutation module controls at least one motor based on the control signal.

10. The system of claim 9, wherein each of said plurality of motors has a corresponding DSP and gate driver interface and a corresponding commutation module.

11. The system of claim 9, wherein at least one of said plurality of motors shares one DSP and gate driver interface and one motor commutation module.

12. The system of claim 9, wherein at least one of said plurality of motors is a binary-function motor, and wherein the controller further comprises a card to control said at least one binary-function motor.

13. The system of claim 9, wherein at least one of said plurality of motors is a variable speed motor, and wherein said at least one commutation module controls at least one variable speed motor.

14. The system of claim 9, further comprising a local DC power supply that acts as a backup power supply to power said plurality of motors, and wherein the plurality of DSP and gate drivers switch to the DC backup power supply to power at least one motor in the event of a main power failure.

15. The system of claim 9, further comprising a system controller that controls operation of the plurality of motors according to an instruction from the multi-motor controller.

16. The system of claim 15, wherein the system controller is connected to the multi-motor controller via a connector selected from the group consisting of a serial connector or an Ethernet connector.

17. The system of claim 15, wherein there are a plurality of multi-motor controllers connected to the system controller.

18. The system of claim 9, wherein said plurality of fluids include at least oil and water.

19. The system of claim 18, wherein said plurality of fluids further includes fuel.

20. (Previously Presented) The system of claim 19, wherein a single fluid-handling device moves both water and fuel.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.